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BOTANY.

Botany at the Rochester Meeting.—There was so much Botany at the Rochester meeting of the American Association for the Advancement of Science that the space here given will scarcely more than admit of a catalogue of the papers and their authors. The botanical work was divided into that of the section and of the club. Section F at the Rochester meeting included all papers which came under the broad head of biology, and of these the total was no less than fifty-seven, a large share being upon botany. At the Washington meeting there was a proposition made to divide the section into two, namely one for zoology and one for botany. After a thorough canvass of the subject in the Section the council finally voted unanimously to recommend such a division and it was made by the Association. The new Section of Botany takes the letter G, and hereafter botanists will be by themselves in Section G.

The first two papers in the Section were by Dr. N. L. Britton upon—"Notes on *Ranunculus repens* and its Eastern North American Allies" and "Notes on a Monograph of the North American species of *Lespedeza*". A large number of specimens were shown which enforced the position taken by the author. Mr. W. W. Rowlee instructor in Botany at Cornell University presented a paper upon "The Root System of *Mikania scandens*, in which the strange development of a mass of fibrous roots was brought out. Specimens were shown of the bog water masses of roots. Prof. L. M. Underwood gave a "Preliminary comparison of the Hepatic Flora of boreal and sub-boreal regions" showing many points of difference.

Dr. E. F. Smith gave two papers bearing upon his long prosecuted labors namely—"On the value of wood ashes in the treatment of peach yellows" and "On the value of superphosphates and muriate of potash in the treatment of peach yellows". The genuine "yellows" is not cured by the use of plant food and is a specific disease. When asked for the cause of the trouble Dr. Smith replied that he wished he knew.

Prof. Macloskie presented "Notes on Maize" and advocated this plant as worthy of becoming the "National flower"—"Spikes of wheat bearing abnormal spikelets" was a paper by Dr. Beal, as also the following—"A study of the relative length of the sheaths and internodes of grasses for the purpose of determining to what extent

this is a reliable specific character". Both papers were fully illustrated by specimens and wall charts.

Mr. Rowlee's second communication was "Adaptation of seeds to facilitate germination" in which he showed that many structures apparently for dissemination were for holding water or otherwise aiding in germination. Dr. H. L. Russell in "Bacteriological investigations of marine waters and the sea floor" showed that microorganisms exist in great numbers in the deep sea and that such forms offer many advantages for the study of physiological problems. Mr. T. V. Coville gave a "Sketch of the flora of Death Valley, California," where he has spent some time in the study of the strange forms. "How the application of hot water to seeds increases the yield" was shown by Dr. J. C. Arthur. The hot bath stimulates the development of a ferment and this quickens the seed to greater vitality and growth. Prof. L. H. Bailey "On the supposed correlation of quality in fruits—a study in evolution", showed that cultivated fruits are an improvement in flavor as well as in size over the wild forms from which they came.

A second paper by Dr. Russell was upon "Non-parasitic bacteria in vegetable tissue". There was some discussion following it, upon the method of penetration of organisms through vegetable tissues, the continuity of protoplasm offering the best explanation.

Prof. Kellerman's two papers were "Notes on yellow pitch-pine—*Pinus rigida* Mill., var. *lutea* Kell., n. v." and "Germination at intervals of seed treated with fungicides" the latter showing some striking results. In his study of "The fertilization of pear flowers". Mr. M. B. Waite found that the barrenness of orchards in some cases can be explained by the impotency of self-pollination.

Mr. T. B. Maxwell presented the results of "A comparative study of the roots of Ranunculaceæ." In "Adaptation of plants to external environment" Prof. W. P. Wilson, by means of a large number of lantern slides showed the influence of heat, light, high altitude, etc., upon the position of leaves upon various species of plants. Prof. S. A. Beach presented "Notes on self-pollination of the grape" and showed that some sorts need foreign pollen. "The comparative influence of odor and color in attracting insects" was brought out by Mr. G. B. Sudworth. "Notes on *Daucus carota*" were given by Prof. C. W. Hargitt. A second paper by Mr. Coville, "Geographic relationship of the flora of the high Sierra Nevada, California," gave further results of the author's studies in the far west. Rev. W. M. Beauchamp presented "Variation in native ferns," followed by D. G. Fairchild on "Live-forever eradicated by a fungous disease," a rare instance of a

weed being successfully exterminated by a parasite. In the absence of the author, Dr. Vasey's paper upon "Otto Kuntze's changes in the nomenclature of North American grasses" was read only by title. A combination paper by Messrs Fernow and Sudworth upon "Revised nomenclature of the arborescent flora of the United States" was passed with a few remarks by Prof. Fernow, stating that the subject matter had been disposed of in the Botanical Club. A third paper by Mr. Coville was upon "Characteristics and adaptations of desert vegetation." In his absence, Mr. F. Roth's paper "Shrinkage of wood as observed under the microscope" was passed, as likewise two sent by Prof. Pammel upon "*Peziza sclerotium*" and "Temperature, and some of its relations to plant life." The "Pleospores of *Tropæolum majus*," "Secondary spores of anthracnoses" and "A bacterium of *Phaseolus*" were read by B. D. Halstead. Prof. Meehan's paper, "The significance of cleistogamy," in the author's absence was read by title, thus closing the schedule of botanical papers of Section F, with a total of thirty-eight papers.

The Botanical Club held many meetings and they were largely attended. In the absence of the president, Prof. Spalding, Dr. H. H. Rusby was elected to the chair. Mr. Coville presented a paper upon "Range, locality, station, and habitat." After considerable discussion the conclusion seemed to be that "range" was the region over which a species naturally grows; "locality," the geographic position of the species; "station," the spot where the species occurs, and "habitat," the kind of place where the individual specimens grow.

Thomas Morong gave a paper upon "Travels in Paraguay, and its flora." Dr. Rusby, also an exploring botanist, remarked upon the trials and dangers of such work. Prof. Underwood showed "A variety of *Polypodium vulgare* L., new to America."

The paper by Mr. Maxwell on "Symbiotic growths in the roots of Ranunculaceæ" brought out many questions, particularly from the mycologists. "Some rare and interesting fungi from Florida" were shown by Mr. Swingle and fully discussed.

Mr. Morong's second paper "Observations upon certain species of Asclepiadaceæ as insect traps" was discussed by Dr. Beal and others, after which Dr. Vasey gave a full account of the work of the Botanical division of the U. S. Department of Agriculture.

Dr. Arthur spoke next of the Botanical Congress at the World's Columbian Exposition, and the subject was considered at length and a committee appointed to confer with officers of the new section of botany in the matter. Mr. O. F. Cook who has recently returned from

Africa gave the next paper upon "General notes on the cryptogamic flora of Liberia."

A large portion of the sessions was taken up with the consideration of the important subject of nomenclature. A committee was appointed early in the meeting and its report fully considered. While space will not allow the whole of the conclusions arrived at, the following are given as showing the thoroughness of the work: "Publication of a genus consists only (1) in the distribution of a printed description of the genus named; (2) in the publication of the name of the genus and the citation of one or more previously published species as examples or types of the genus with or without a diagnosis." The "publication of a species consists only (1) in the distribution of a printed description of the species named; (2) in the publishing of a binomial, with reference to a previously published species as a type."

The following are some of the papers presented at the Club: "Some of the rare mosses of White Top and vicinity, recently collected on a trip to Southwestern Virginia, with specimens," by Mrs. E. G. Britton; "Galvanotropism," by Dr. Arthur; "Anatomy as a special department of Botany," by Miss Gregory; "A botanical terminology," by A. A. Crozier; "Notes on some pear and apple diseases," by B. M. Waite; "Modifications of the tomato fruit resulting from seed selection," E. S. Goff; "Cultivated species of Bassica," by L. H. Bailey; "Notes on the mountain flora of Northern Alabama," by Dr. Mohr; "Notes on the distribution of plants in Florida," by P. H. Rolfs; "North American Cacti," by Prest. Coulter; "On the proposed handbook of mosses of Eastern America, with specimens," by Mrs. Britton; "Weeds and weed roots," by B. D. Halsted; "The re-discovery of *Juncus cooperi*," by F. V. Coville; "Some general questions in the classification of Myxomycetes," by O. F. Cook; "The North American Amelanchiers," by N. L. Britton; "Observations on the North American species of Orchidaceæ and their nomenclature," by Thos. Morong; "A new form of root cage," by J. C. Arthur; "The botanical garden movement in New York," by N. L. Britton; "A few additions to the hepatic flora of the Manual region," by L. M. Underwood; "Notes upon a revision of the North American Naidaceæ," by Thos. Morong; "On the genus *Campylopus* in North America," by Mrs. Britton; "Some noteworthy features of the flora of West Virginia," by Dr. Millspaugh; "Notes on a recent outbreak of peach yellows near Ann Arbor, Mich.," by A. A. Crozier; "Some observations on *Epigea repens*," by Dr. Wilson; "Notes on some species of Crataegus," by Dr. Britton; "Observations on the ripening of the seeds of

Cuphea," by Mrs. Wolcott; "On the genus *Ditrichium* in North America, with one western species, and corrections for two eastern species," by Mrs. Britton; "Notes on terminology," by Thos. Holm; "Notes on some fungi common during the season of 1892, at Ames, Ia.," by L. H. Pammel; "Notes on some Kansas weeds," by A. S. Hitchcock; "Notes on the flora of Block Island," by W. W. Bailey; "Notes on the distribution of a few plants," by L. H. Pammel also "Phænological notes for 1892," by Prof. Pammel. This is a total of forty-one papers for the club. These with the thirty-eight named as on the programme of Section F give a grand total of seventy-nine papers presented at Rochester by the botanists. Many others not here mentioned were given before the Microscopical Society and the Society for the Promotion of Agricultural Science, so that it is safe to state that the number of botanical titles at the several conventions held at Rochester during ten days was in the neighborhood of, if it did not exceed, one hundred.

It was evidently the botanist's meeting, and with a new section established for them in the A. A. A. S., the workers upon plants, in all the various departments, may well feel encouraged to go forward to greater triumphs in the near future.—BYRON D. HALSTED.

Citation of Authors of Genera and Species.¹—In order to obtain stability of nomenclature it is necessary to provide that the name of a plant, the specific name, cannot be changed through caprice or whim. Nor can it be changed through ignorance, providing the mistake through which the name was made has been discovered. The refusal to correct mistakes and the disinclination to do thorough bibliographical work before publishing a new specific name is the cause of most confusion in botanical nomenclature. Hence has arisen the so-called international law or law of priority which provides that the earliest published specific name of any plant must stand, providing that the name is not antedated by some other similar name applied to a plant belonging in the same genus. Many botanists do not admit the validity of this principle except in the case of species which they may have themselves named and published. With reference to others they are accustomed to insist that "customs," "long established habit" and a conservative condition must be maintained. This is to save the difficulty of having to revise their own systems of nomenclature, and serves in many cases to cover inaccuracies or hastiness. With this

¹From "The Metaspermæ of the Minnesota Valley," in Report of the Geological and Natural History Survey of Minnesota (1892).

conservative position, the unthinking and unbotanical are always distinctly satisfied and are accustomed to declare that botanical nomenclature is purely a "practical matter" and should be taken out of the hands of the botanists altogether and turned over to some unprofessional commission for settlement. Objections of this sort are natural, for the changing of names in our accustomed department of science is always a confusing matter. Such criticism is, however, unthinking and unbotanical because it fails to recognize that the whole difficulty has originated on account of just such conditions as are extolled and recommended for perpetuation. The only way to obtain a stable nomenclature is by rigidly enforcing the law of priority with reference to specific names. All instability finds its well spring in the disregard of this law, and stability under our present general system of nomenclature can only be obtained by strict adherence to the oldest available specific name, by whomever or wherever it may have been published.

The cause of the present upheaval in plant nomenclature, signalized but not at all initiated, by such a book as that of Kuntze, is very easy to discover. Never so much as to-day has botany become world-wide. The multiplicity of periodicals, the facilities for exchange and correspondence between different countries, expeditions, congresses, communications, the development of new centers of activity in all parts of the globe, all conspire to make insularity of nomenclature impracticable, except for those who do not care to be within the pale of modern conditions. It was a matter of less importance fifty years ago, if the name *Potamogeton pauciflorus* was given to one plant in France, by Lamarck, and to quite a different plant in America, by Pursh. There was less danger of confusion, for French botanists and American botanists were not then so distinctly interested in each other's field. The international character of science was recognized long ago in the adoption of an international language—Latin—in which oriental and occidental investigators can communicate, whatever their native dialect. The law of priority simply carries this recognition farther, and provides that in the department of nomenclature Latin shall be used in the same sense in all countries.

In America the rightful implication of the law of priority has been ably expounded by Britton and Greene, seconded by many others. Under their leadership most of the younger school of botanists have determined to enlist, but the older men whose life works have been largely accomplished under the older and insular interpretation, the provincial dispensation, as it may be named, have in most cases failed to withdraw from the position of their youth—the "position of nam-

ing-plants-as-one-pleases"—and their publications are in consequence marred by the illegal nomenclature. Manuals and handy reference floras, most local lists and many monographs have perpetuated the faulty and insular methods and it is but very recently that a concerted attempt is being made to establish this department of botanical work upon the only sure foundation possible without a complete withdrawal from the existant system.—CONWAY MACMILLAN.

Rules of Botanical Nomenclature.—It is with great pleasure that we print the following rules of botanical nomenclature, as adopted by the Botanical Club of the American Association for the Advance- of Science, at a meeting held in Rochester, August 19th, 1892. We trust that they will be generally accepted by American botanists.

Resolved: That the Paris code of 1867 be adopted, except where it conflicts with the following:

I. THE LAW OF PRIORITY.

Priority of publication is to be regarded as the fundamental principle of botanical nomenclature.

II. BEGINNING OF BOTANICAL NOMENCLATURE.

The botanical nomenclature of both genera and species is to begin with the publication of the first edition of Linnæus "*Species Plantarum*," in 1753.

III. STABILITY OF SPECIFIC NAMES.

In the transfer of a species to a genus other than the one under which it was first published, the original specific name is to be retained, unless it is identical with the generic name or with a specific name previously used in that genus.

IV. HOMONYMS.

The publication of a generic name or a binomial, invalidates the use of the same name for any subsequently published genus or species respectively.

V. PUBLICATION OF GENERA.

Publication of a genus consists only (1) in the distribution of a printed description of the genus named; (2) in the publication of the name of the genus, and the citation of one or more previously published species as examples or types of the genus, with or without a diagnosis.

VI. PUBLICATION OF SPECIES.

Publication of a species consists only (1) in the distribution of a printed description of the species named; (2) in the publishing of a binomial, with reference to a previously published species as a type.

VII. SIMILAR GENERIC NAMES.

Similar generic names are not to be rejected on account of slight differences, except in the spelling of the same word; for example, *Apios* and *Apium* are to be retained, but of *Epidendrum* and *Epidendron*, *Asterocarpus* and *Astrocarpus*, the latter is to be rejected.

VIII. CITATION OF AUTHORITIES.

In the case of a species which has been transferred from one genus, to another the original author must always be cited in parenthesis, followed by the author of the new binomial.

ZOOLOGY.

Fortuitous Variation.—In a paper just published, read before the Biological Society of Washington, on “Some Interrelations of Plants and Insects,” in which Professor C. V. Riley deals with the subjects of *Yucca* pollination and fig caprification, he generalizes from the facts recorded as follows:

“The peculiarities which I have endeavored to present to you are full of suggestion, particularly for those who are in the habit of looking beyond the mere facts of observation in endeavors to find some rational explanation of them; who, in other words, see in everything they observe significances and harmonies not generally understood. The facts indicate clearly, it seems to me, how the peculiar structures of the female *Pronuba* have been evolved by gradual adaptation to the particular functions which we now find her performing. With the growing adaptation to *Pronuba*’s help, the *Yucca* flower has lost, to a great extent, the activity of its septal glands; yet coincident with it we find an increase in the secreting power of the stigma. This increase of the stigmatic fluid has undoubtedly had much to do with originally attracting the moth thereto, while the pollenizing instinct doubtless became more and more fixed in proportion as the insect lost the power or desire of feeding. With the mind’s eye I can look back into the past and picture the gradual steps by which the *Prodoxids* to which I have alluded have differentiated along lines which have resulted in